

Remarks

Favorable reconsideration of this application in view of the amendments and remarks to follow is respectfully requested. Since the present Response raises no new issues, and in any event, places the application in better condition for consideration on appeal, entry thereof is respectfully requested under the provisions of 37 C.F.R. §1.116.

Prior to discussing the prior art rejections, Applicants take this opportunity to set forth the following brief remarks about their invention. Applicants have discovered a method for forming a splined shaft that does not include retrogressive heat treating (RHT), in which the splines are formed prior to the extrusion reaching a T4 condition. Applicants have determined that natural aging may be retarded to cooling the metallic tube to greater than 5°C below room temperature by a rapid quench following extrusion or solution heat treating of the metallic tube. In an effort to more clearly reflect this aspect of the invention, Applicants have amended Claim 23 to recite a method for forming splines on a metallic tube including the step of controlling time and/or temperature exposure conditions of said metallic tube so that a T4 temper is not achieved by cooling the metallic tube to at least 5°C below room temperature in order to retard natural aging followed by forming splines on the metallic tube within about 12 hours after completion of cooling to a temperature to retard natural aging. Support for the amendment to Claim 23 is found in original Claims 31 and 32. In light of the amendment to Claim 23, Claims 31 and 32 have been cancelled. Applicants have also cancelled Claims 1-22.

Further search is not required for consideration of amended Claim 23, as the limitation added were originally recited in Claims 31 and 32, therefore previous searches relating to Claims

23, 31 and 32 are applicable to amended Claim 23. Since the above amendments do not introduce any new matter into the application entry thereof is respectfully requested.

Claims 1, 3-6, 8-10, 12-18, 21, 23, 25-31, and 34-36 stand rejected, under 35 U.S.C. §103(a), as being allegedly unpatentable over U.S. Patent No. 5,911,844 to Benedyk ("Benedyk"). Claims 7, 19, 20, 22, 32, 33, and 37-39 stand rejected, under 35 U.S.C. §103(a), as being allegedly unpatentable over Benedyk in view of the publication ASM: Aluminum and Aluminum Alloys P. 305, 311, 319, and 462-463 ("ASM"). Claim 11 stands rejected under 35 U.S.C. §103 (a) as allegedly being unpatentable over Benedyk in view of U.S. Patent No. 6,452, 139 to Benoit et al. ("Benoit et al."). Applicants respectfully traverse for the following reasons.

Turning to the rejections under 35 U.S.C. §103, to establish a prima facie case of obviousness three criteria must be met. First there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1543, 1457-58 (Fed. Cir. 1998). Second, there must be a reasonable expectation of success. *In re Merck & Co, Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references) combined must teach or suggest all of the claimed limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicants submit that the applied references fail to render Applicants' claimed invention unpatentable, since none of the applied prior art, either alone or in combination, teach or suggest a method of forming splines on a metallic tube that forms splines on an aluminum extruded tube

prior to the formation of a T4 conditional without utilizing a retrogressive heat treatment. More specifically, none of the prior art references disclose controlling time and/or temperature condition of the metallic tube following solution heat treatment by cooling the metallic tube to at least 5°C below room temperature to retard natural aging so that a T4 temper is not achieved, as recited in amended Claim 23. “To establish a prima facie case of obviousness of a claimed invention all the claimed limitations must be taught or suggested by the prior art”. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 44, 496 (CCPA 1970).

Benedyk disclose a method for forming a metallic having T5 or T6 temper. More specifically, Benedyk discloses a method for increasing formability for drawing or stamping of hardened materials of T5 or T6 temper, which are typically too brittle to subject to draw and stamping operations. Benedyk disclose subjecting the T5 or T6 material to a temperature that softens the materials temper, by retrogressive heat treatment, hence removing the effects of the materials T5 of T6 heat treatment. Benedyk does not disclose T4 temper or methods for retarding natural aging of metals to avoid the formation of a T4 condition. Therefore, since Benedyk does not disclose T4 tempers or a method for retarding natural aging, Benedyk fails to disclose a method that includes the step of controlling the time and/or temperature condition of the metallic tube following solution heat treatment by cooling the metallic tube to at least 5°C below room temperature to retard natural aging so that a T4 temper is not achieved, as recited in amended Claim 23. Benedyk also fails to disclose forming splines on the metallic tube within about 12 hours after completion solution heat treatment to avoid natural aging prior to the forming step, as recited in amended Claim 23.

Referring to Page 4, paragraph 4 of the present Office Action, it is the Examiner's position that although Benedyk does not mention controlling time and/or temperature exposure conditions of said metallic tube so that a T4 temper is not achieved, the Examiner alleges that changes in concentration or temperature will not generally support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. Criticality of a variable may be proven when the variable is a results effective variable. Referring to paragraphs 40-45 of Applicants' disclosure, Applicants disclose that splines being cold formed on tubes of 6013 Aluminum Alloy being natural aged for two weeks exhibited cracking, wherein tubes of 6013 that were limited to room temperature for less than 12 hours could be cold formed without experiencing cracking. The natural aging time is critical to the materials ductility. Therefore, since the natural aging period is a results effective variable and Benedyk fails to teach or suggest controlling time and/or temperature exposure conditions to ensure that a T4 temper is not achieved, the Benedyk reference fails to render amended Claim 23 and all claims depending therefrom non-obvious.

The ASM fails to fulfill the deficiencies of the primary reference, since the ASM also fails to teach or suggest a method of forming splines on a metallic tube including the step of controlling the time and/or temperature condition of the metallic tube following solution heat treatment by cooling the metallic tube to at least 5°C below room temperature to retard natural aging so that a T4 temper is not achieved, as recited in amended Claim 23. Applicants submit that the ASM publication is far removed from Applicants' method. Page 305 of the ASM discloses general forming and straightening following quenching processes, Page 311 of the ASM discloses precipitate hardening, and Page 319 discloses annealing, wherein these general

teachings do not meet the limitation of cooling the metallic tube following solution heat treat to retard natural aging by cooling to a temperature of 5°C below room temperature. Therefore, since the combination of Benedyk and the ASM fail to teach or suggest each and every limitation of Applicants' claimed method, it is respectfully requested that the present §103 rejection citing Benedyk and the ASM be withdrawn.

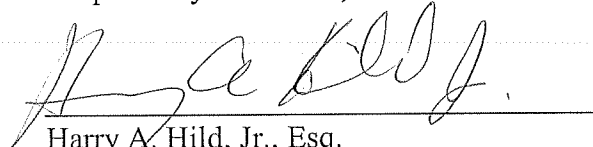
Benoit et al. also fail to fulfill the deficiencies of Benedyk, since Benoit et al. also fail to teach or suggest a method of forming splines on a metallic tube including the step of controlling the time and/or temperature condition of the metallic tube following solution heat treatment by cooling the metallic tube to at least 5°C below room temperature to retard natural aging so that a T4 temper is not achieved, as recited in amended Claim 23. Benoit et al. disclose a process for joining high strength metal components by electromagnetic forming techniques and is far removed from the Applicants' invention. Applicants note that the Examiner is relying on the Benoit et al. reference solely to meet the limitation of rotating the metallic tube during heat treatment. There is no disclosure of Applicants' claimed method of forming splines on a metallic tube throughout the Benoit et al. reference. Therefore, since the combination of Benedyk and the Benoit et al. fail to teach or suggest each and every limitation of Applicants' claimed method, it is respectfully requested that the present §103 rejection citing Benoit et al. and the ASM be withdrawn.

Accordingly, the Examiner is respectfully requested to reconsider the application, withdraw the rejections and issue an immediate a favorable action thereon. If upon review of the application, the Examiner is unable issue an immediate Notice of Allowance, the Examiner is

respectfully requested to telephone the undersigned attorney with a view towards resolving any outstanding issues.

An early and favorable action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Harry A. Hild, Jr.", is written over a horizontal line.

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